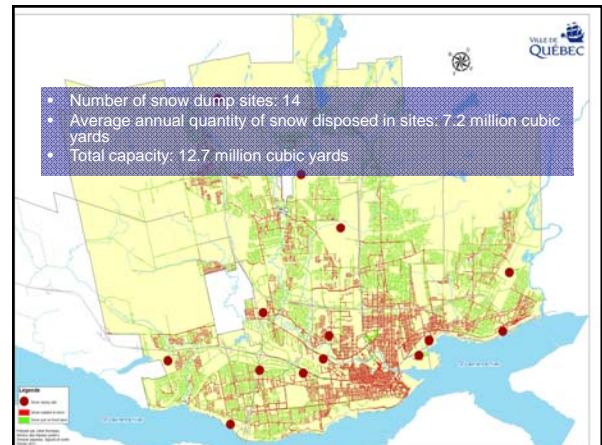
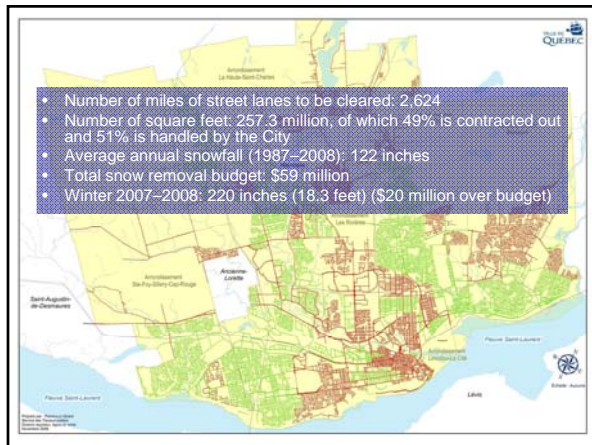




“Among cities with a population of 500,000 or more, Québec City ranks second in the world for the highest snowfall, behind Sapporo, Japan (500 cm or close to 197 in. on average per year).”
PIARC Québec 2010 Bulletin 2



Designing a new snow dump site

Primary considerations:

- Distance from operations
- Location (industrial zone, access to highways)
- Capacity (volume of snow, number of truckloads per hour)
- Noise in residential neighborhoods
- Surface water and groundwater protection

Designing a new snow dump site

Example of design data for Québec City:

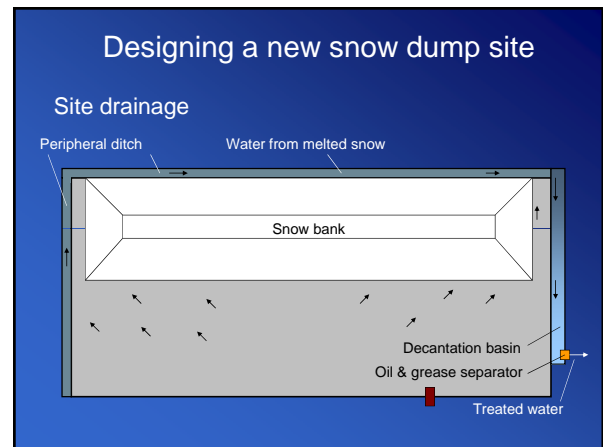
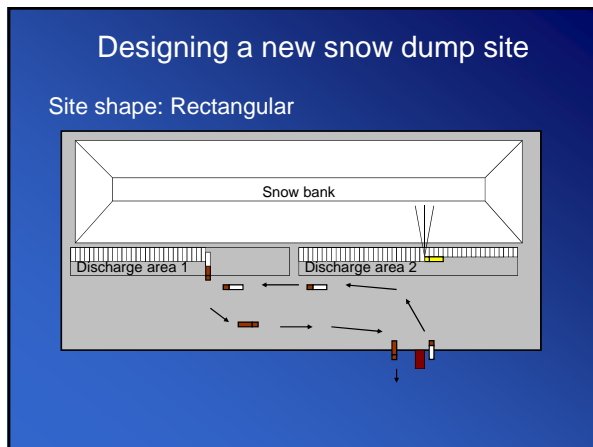
- 8 to 9 trucks per street snowblower (2–3 miles from street to snow dump)
- 1 gate for a peak of 250 trucks per hour
- 1 high capacity snow dump snowblower per 125 truckloads per hour

Designing a new snow dump site

Choose your operation mode:

- Snowblower: maximize efficiency, rapidity, and capacity (banking the snow higher: up to 72 feet/process up to 125 truckloads per hour)
- More versatile equipment: loader with a snow plow with ears and an excavator with a big loader bucket
- The best: a combination of snowblower, loader, and excavator





Designing a new snow dump site

Decantation basin:

- Calculate the volume of water generated on the site by a heavy rainfall combined with the snow melted in one hour. Assuming that water in the basin is 3 feet high, you can determine the surface needed for the basin.
- Depending on the nature of the soil and groundwater usage, verify the need to waterproof the basin.
- The salt dissolved in the melted snow will be drawn off first in spring when rivers are already overcharged with water. This will decrease the effects of chlorine ions on the river environment.
- An elongated basin will be more efficient.





Operation of the snow dump

Access control:

- In Québec City each trucker uses a radio-frequency pager identified with the truck number.
- Each trip is validated by the snowblower operator.
- At the gate, the information on the pager is transferred by RF to the system.
- This information is used to pay the truckers and snow dump contractors.
- A computerized system prevents traffic congestion at the gate.

Validation device (snowblower) and pager (truck)



Operation of the snow dump

Traffic control:

- For heavy operation, use signalmen on the site.
- Separate 10–12 wheelers from semi-trailers: semi-trailers do not maneuver as fast as 10–12 wheelers.
- Separate trucks charged with loaders from those charged with blown snow: snow charged with loaders may contain hard objects which can break the snow dump snowblower and therefore paralyze operations.

Operation of the snow dump

Security:

- To prevent avalanches from the snow bank, make sure you keep a distance corresponding at least to a 45° angle from the ground to the top of the snow bank. To stabilize the snow bank, use an abutment made of snow from trucks charged with loaders in the previous step. When you begin the next step, just blow the snow over the abutment.



Operation of the snow dump

Tip to maximize capacity:

- Use an excavator to pile the snow higher on the snow bank.

After the winter, when the snow is melted down

- Clean the site: remove all debris.
- Remove sediment from ditches and basins.
- Repair all fences.

Emergency site opening

- Use an asphalt surface.
- Make sure the surface water from the site will flow into the sewage system for later treatment.
- Use conventional equipment like loaders and excavators.

Conclusion

In the last few years, many cities have had to deal with unprecedented snow storms. This makes it necessary to evaluate environmentally acceptable solutions for disposing of the snow from snow removal operations.

I hope these guidelines will help you with this challenge.




Thank you!

Contact: eric.langlois@ville.quebec.qc.ca

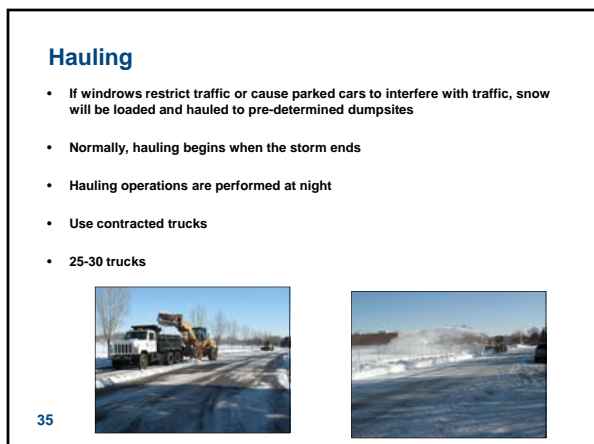
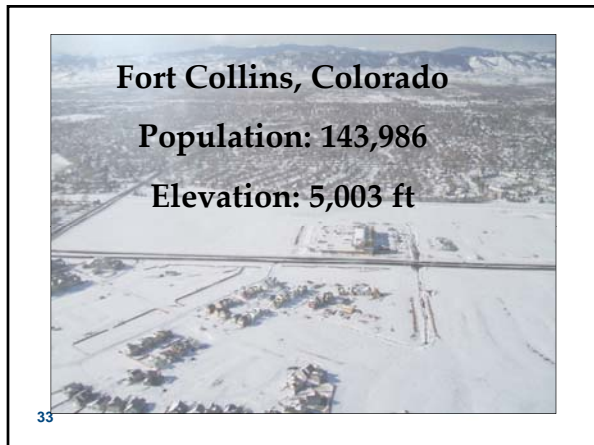
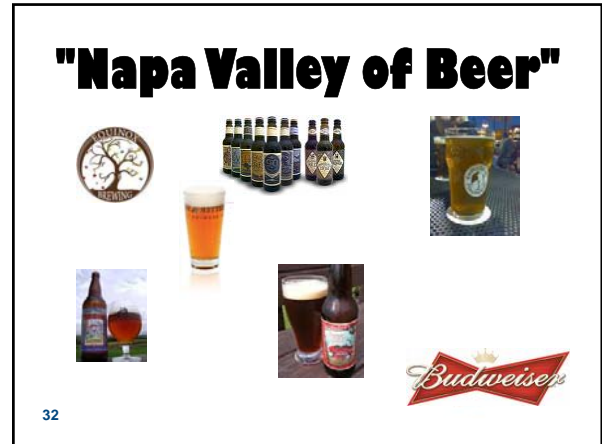
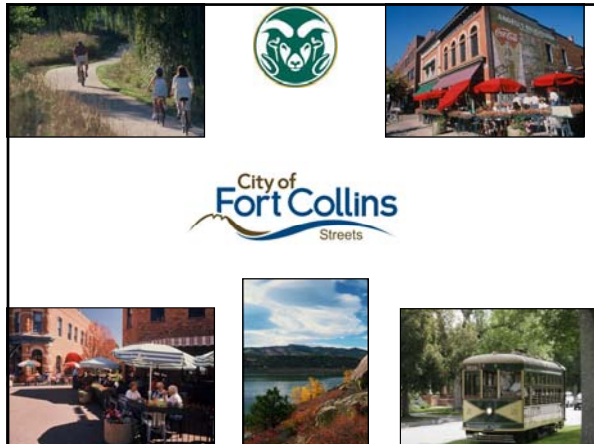
Snow Dump Sites

Understanding What to Do With Collected Snow

Larry Schneider
City of Fort Collins



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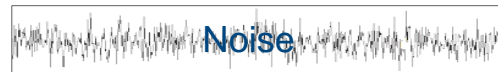


Snow Dump Sites

- Things to consider:
 - Noise
 - Sufficient light
 - Location
 - Accessibility
 - Environmental Regulations



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- Fort Collins Regulations:
 - Day-time 55 dBA; night-time 50 dBA
 - Code exceptions for snow
- Neighborhood proximity
- Tailgate slamming
- Jake brakes
- Heavy equipment
- Backup alarms



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Sufficient Light

- Lighting towers
- Heavy equipment lights



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Fort Collins' Locations

CSU Stadium

- Allows for additional dumping space
- 55 Acres



Mobile dump site

- 13 Acres



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Location

- Next to stream, pond, etc.
- Sufficient space
 - Type of trucks: tandems, end-dumps, etc.
 - Turning radius for trucks



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Accessibility

- Roads leading into site
 - Arterials/collectors
 - Plan your haul routes
 - Night operations
 - Work with traffic signal department
 - Four-way flash
 - Provide traffic control at night



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Environmental BMP

- Run-off/drainage
- Testing
 - Heavy metals
 - Oils
 - Conductivity
 - Temperature
 - PH
- Barriers for run-off on the down gradient edge of the snow dump site



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End of Season

- Clean up your site
 - Trash, litter, etc.
 - Check vegetation for damage



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Questions?



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